A SYSTEM AND METHOD EMPLOYING A GRID INDEX FOR LOCATION AND PRECISION ENCODING

ABSTRACT OF THE DISCLOSURE

A system and method for combining the precision estimate of a database entry's coordinate value such that the precision information is included as part of the one-dimensional index. This is done by constructing a hierarchical index in which the size of the grid is related to the precision of the coordinate value. A grid index is a gridding of an n-dimensional space into a regular partition of the grid space into grid units, for which for a point in space, x, there is a function index (x), which retrieves a unique integer value for the grid that contains Point x, and a function coordinate(y, s), which returns a point associated with the index y at scale s. A hierarchical grid index is effectively a number of grid indices overlaid on the same space, with grid units of different sizes. In this case, each of the functions employs an additional argument that specifies the size of the grid unit to use. Thus, assuming that the grid size, s, is drawn from a set of grid sizes, S, Index (x,s) returns a unique integer value for the grid of size s that contains Point x. Hierarchical indexes may be used to enhance the performance of database queries. A query that seeks results from a small grid size, s_{small}, does not seek matches at a large grid size, s_{large}. Similar calculations can be performed for a finite area A.